

# 6ES8

## Variable-Mu Twin Triode

### 9-PIN MINIATURE TYPE

#### GENERAL DATA

##### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.365	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield<sup>a</sup></i>	
Grid to plate (Each unit) . .	1.9	1.9	$\mu\text{f}$
Plate to cathode (Each unit). .	0.18	0.17	$\mu\text{f}$
Heater to cathode (Each unit). .	3	3 <sup>b</sup>	$\mu\text{f}$
Plate of unit No.2 to plate of unit No.1. . . . .	0.04 max.	0.015 max.	$\mu\text{f}$
Plate of unit No.2 to grid of unit No.1. . . . .	0.003 max.	0.003 max.	$\mu\text{f}$
Grid of unit No.1 to cathode of unit No.2. . . . .	0.002 max.	0.002 max.	$\mu\text{f}$

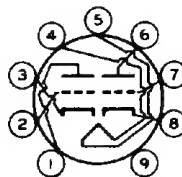
##### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage . . . . .	90	90	90	volts
Grid Voltage. . . . .	-1.2	-5	-9	volts
Plate Resistance (Approx.). . . . .	2500	-	-	ohms
Transconductance. . . . .	12500	625	125	$\mu\text{mhos}$
Plate Current . . . . .	15	-	-	ma

##### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length. . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Diameter. . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See <i>General Section</i>
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9AJ

Pin 1 - Plate of  
Unit No.2  
Pin 2 - Grid of  
Unit No.2  
Pin 3 - Cathode of  
Unit No.2  
Pin 4 - Heater  
Pin 5 - Heater



Pin 6 - Plate of  
Unit No.1  
Pin 7 - Grid of  
Unit No.1  
Pin 8 - Cathode of  
Unit No.1  
Pin 9 - Internal  
Shield



RADIO CORPORATION OF AMERICA  
Electron Tube Division  
Harrison, N. J.

DATA  
5-61

# 6ES8

## AMPLIFIER — Cascode Type

### Maximum Ratings, Design-Center Values:

PLATE SUPPLY VOLTAGE		
with plate current = 0. . . . .	550 max.	volts
PLATE VOLTAGE (Each Unit) . . . . .	130 max.	volts
GRID VOLTAGE:		
Negative-bias value (Each Unit) . . . . .	50 max.	volts
CATHODE CURRENT (Each Unit) . . . . .	22 max.	ma
PLATE DISSIPATION (Each Unit) . . . . .	1.8 max.	watts
HEATER-CATHODE VOLTAGE:		
Unit No. 1: <sup>c</sup>		
RMS voltage between cathode and heater. . . . .	50 max.	volts
Unit No. 2: <sup>d</sup>		
RMS voltage between cathode and heater <sup>e</sup> . . . . .	50 max.	volts
DC voltage between cathode and heater <sup>e</sup> . . . . .	130 max.	volts

### Typical Operation:

*In a cascode-type circuit with the grid of the output unit connected to a voltage divider<sup>f</sup>*

Supply Voltage. . . . .	180	volts
Plate Current . . . . .	15	ma
Transconductance. . . . .	12500	$\mu$ mhos
Noise Figure <sup>g</sup> . . . . .	6.5	db
Grid Voltage (Approx.) for		
transconductance ( $\mu$ mhos) = 125. . . . .	-9	volts
Input Voltage for cross-modulation		
factor = 0.01 and transconductance		
( $\mu$ mhos) = 125 . . . . .	500	millivolts

### Maximum Circuit Values:

Grid-Circuit Resistance (Each Unit) . . .	1 max.	megohm
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<sup>a</sup> With external shield JEDEC No. 315 connected to cathode of unit under test except as noted.

<sup>b</sup> With external shield JEDEC No. 315 connected to ground.

<sup>c</sup> Grounded-cathode input unit—pins 6, 7, and 8.

<sup>d</sup> Grounded-grid output unit—pins 1, 2, and 3.

<sup>e</sup> Cathode positive with respect to heater.

<sup>f</sup> In order not to exceed the maximum-rated plate voltage when the cascode-type amplifier is controlled, it is necessary to use a voltage divider for the grid of the grounded-grid output unit.

<sup>g</sup> Measured with tube operating in a television tuner.

